

REMARKS

In the present amendment, new claim 17 has been added. Accordingly, claims 1, 2, 4-12, and 14-17 are pending in the application, with claims 1, 9 and 17 being independent. Of the pending claims, claims 1, 2, 4-8, 15, 16 and 17 are under consideration and claims 9-12 and 14 are withdrawn from consideration.

New independent claim 17 has been added by employing additional process steps in comparison to independent claim 1. Support for the process steps can be found in the present specification, e.g., paragraphs [0050] and [0051] of the published application.

No new matter has been added.

Response to Rejections under 35 U.S.C. § 103(a)

The Office Action makes the following claim rejections under 35 U.S.C. § 103(a):

- claims 1, 2, 4-8 15, and 16 as allegedly being unpatentable over U.S. 6,426,114 to Troczynski et al., hereinafter “TROCZYNISKI,” in view of U.S 2005/0049715 to Ito et al., hereinafter “ITO;” and
- claims 1, 2, 4-8, 15 and 16 as allegedly being unpatentable over TROCZYNISKI in view of ITO and US 2005/0031704 to Ahn, hereinafter “AHN.”

The Office Action asserts that TROCZYNISKI discloses all elements of the presently claimed porous calcium phosphate ceramic body, except that “TROCZYNISKI does not specifically disclose the substrate is a porous calcium phosphate substrate” (see Office Action, page 3, lines 10 to 11). The Office concludes that the deficiency of TROCZYNISKI is disclosed in ITO, which discloses that porous calcium phosphate is useful as implant material. The Office

Action further admits that TROCZYNSKI does not disclose the steps of making a porous calcium phosphate ceramic body according to the presently claimed invention. The Office Action notes, however, that if “the product in the product-by-process claim is the same as or an obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process” (see Office Action, page 4, lines 5-8).

Applicants respectfully traverse the rejection. Applicants note that the presently claimed porous calcium phosphate ceramic body is not an obvious product nor can it be obtained by combining the teachings of TROCZYNSKI and ITO. Applicants point out that the process of making the three-dimensional nanotunnel layers of the presently claimed invention is completely different from the method disclosed in TROCZYNSKI, and therefore, the method disclosed in TROCZYNSKI also leads to a different product, including a different coating structure in comparison to the presently claimed product. For example, Troczynski does not disclose that the solvents need to be completely removed before drying at elevated temperature. In contrast, the present specification clearly teaches that before heat treatment a drying step is required, whereby the drying temperature must be below the boiling point of water. Paragraph [0050] of the present published application teaches that “when water is boiled, cracking undesirably occurs in the three-dimensional tunnel layers.”

Applicants further note that TROCZYNSKI discloses a porosity of the coating layer of only 35 to 40%, see TROCZYNSKI, column 7, line 6. In contrast, the coating structure of the presently claimed invention employs a much higher porosity, as can be seen, e.g., in Figure 1 of the present application. The present specification underlines the high porosity of the three-dimensional nanotunnel layer structure, e.g., in paragraph [0023], teaching that “the three-dimensional nanotunnel layers 2 are extremely light in weight, the mass ration of the three-

dimensional nanotunnel layers 2 to the porous calcium phosphate ceramic body is negligibly small, for instance, 0.001 to 0.05.”

Moreover, Applicants note that TROCZYNISKI teaches a crystallization temperature of only 350°C, which is commented in TROCZYNISKI as very surprising. Based thereon, TROCZYNISKI recommends a heat treatment at a much lower temperature range than usually employed for calcination, arguing that “low crystallization temperature prevents undesirable deterioration (e.g. oxidation) of the Ti alloy implant surface (see TROCZYNISKI, column 3, line 65-67). In contrast, the present specification teaches the importance of a much higher calcination temperature, being between 600 to 900 °C. Paragraph [0052] of the present specification teaches that “when heat treatment is lower than 600 °C , the three-dimensional nanotunnel layers are too much bonded to the substrate.”

Accordingly, in light of the present invention, it is clear that the three-dimensional nanotunnel structure is very sensitive to the process of making such structure and is specifically adapted for having a porous calcium phosphate substructure as basis for the coating. Based on the disclosure in TROCZYNISKI, one of ordinary skill in the art would not have been able or motivated to make three-dimensional nanotunnel layers of the presently claimed invention. TROCZYNISKI rather teaches away from the present invention by teaching a different process, titan as substrate material and conditions specifically designed for Titan. ITO does not teach the sufficiency of TROCZYNISKI by the mere disclosure of a calcium phosphate substrate.

Applicants further note also that AHN does not teach the deficiency of TROCZYNISKI, by disclosing a calcium phosphate composition which serves as a coating for prosthetic implants. Applicants emphasize that the three-dimensional nanotunnel layers of the presently claimed invention is a unique coating structure, employing a unique method, whereby the product has

excellent new-bone-forming capability and large mechanical strength, which would not have been obvious for one skilled in the art and cannot be obtained by the combining the teachings of the art of the rejections.

In view of the above, Applicants respectfully request withdrawal of the obviousness rejections over TROCZYNSKI and ITO as well as over the combination of TROCZYNSKI, IIITO and AHN.

CONCLUSION

In view of the foregoing, Applicants respectfully request the Examiner to reconsider and withdraw the rejections of record, and allow all the pending claims.

Should the Examiner have any questions regarding this application, the Examiner is invited to contact the undersigned at the below-listed telephone number.

Respectfully Submitted,
Toshio MATSUMOTO et al.


Bruce H. Bernstein
Reg. No. 29,027

Stephen M. Roylance
Reg. No. 31,296

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GREENBLUM & BERNSTEIN, P.L.C.
1950 Roland Clarke Place
Reston, VA 20191
(703) 716-1191